**Grade 7: Variables and Patterns ESL Test:**

1. T shirts cost €6.50 each.
   1. Fill in **the table** below to show the number of t shirts and their cost.

|  |  |
| --- | --- |
| **Number of shirts.** | **Cost**  **(€)** |
| 0 |  |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |
| 6 |  |
| 7 |  |



* 1. **Graph** the information from your table. (make sure you clearly label axes)

|  |  |  |  |  |  |  |  |  |  |  |
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* 1. State the **Independent** Variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

State the **Dependent** Variable: ­­­­­­­­­­­­­­­­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. Write a **rule** to find the cost for any number of shirts.

**Key N** : number of shirts

***C****:* cost for t shirt

* 1. Use your rule to find the cost for **30** t shirts.

1. Rei looks at prices at two CD shops:
   * + At Free Record Stores it costs € 15 for each CD you buy.
     + At Virgin Record Stores you pay a membership of €25 first and then €10 per CD you buy

a. Fill in **the table** for both Free Record stores and Virgin record stores

|  |  |  |
| --- | --- | --- |
| Number of CD’s | Free Record Stores | Virgin Record Stores |
| 0 |  |  |
| 1 |  |  |
| 2 |  |  |
| 3 |  |  |
| 4 |  |  |
| 5 |  |  |
| 6 |  |  |
| 7 |  |  |
| 8 |  |  |
| 9 |  |  |
| 10 |  |  |

* 1. **Graph** the information for both record stores onto one graph. (carefully label the graphs)

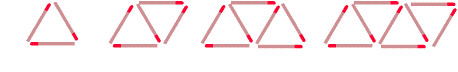
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* 1. At what cost do the two graphs **intersect**?
  2. Key: N is the number of CDs

T is the total cost of the CDs,

Write a **rule** for:

1. Free Record Shop \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Virgin Record Store \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   1. \* If Rei spent €225 at Free Record Store, how many CDs did he buy?
   2. \* If Rei spent €365 at Virgin Record Store, how many CDs did he buy?
3. The following patterns is built out of matchsticks:



Unit 1 Unit 2 Unit 3 Unit 4

* 1. Complete the **table** for the pattern above:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Number of units (n) | 1 | 2 | 3 | 4 |
| Number of matchsticks (m) |  |  |  |  |

* 1. Find the **rule** connecting ***m*** and ***n***.
  2. Find the number of matchsticks required to make the **12th unit.**

1. Haruka baby sits and charges €12 for the first hour and the €8 for each hour after that:
   1. Use the graph to find how much Haruka would charge for:
2. 3 hours:
3. 6 hours:
   1. \*Write a **RULE** for Haruka’s fees. **(Make a key)**
   2. \*Use your rule to find how much Haruka would charge if she worked from 8:00 until 22:00.
4. The following is a rule for a matchstick pattern:

Where ***m*** is number of matchsticks and ***n*** is the unit number

*m* = 2*n* +6

a. Complete the table using the rule above.

( Show all your working below the table for each *n*)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| ***n*** | 0 | 2 | 4 | 7 | 10 | 15 | 20 |
| ***m*** |  |  |  |  |  |  |  |

1. Student Bike Tours **income** and **expenses**

Income: €370 per customer.

Expenses: Bike Rental €20 per customer

Food and camp costs €95 per customer

Van cost set at €225

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| No of customers | Income | Bike rental | Food and camp costs | Van | Expenses | Profit |
| 1 |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |

a. Fill in the table below:

b. Write rules in terms of N for the following:

1. Income: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Bike Rental: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Food and camp costs: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Expenses: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Profit: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c. Find the amount of **profit** for 10 customers using your rule for profit above. Show working

1. \*The following is the cost of Blue bike tours

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| No of bikes | 5 | 10 | 15 | 20 | 25 | 30 | 35 |
| Cost € | 200 | 455 | 665 | 750 | 800 | 840 | 865 |

* 1. How much would it cost to rent 12 bikes?
  2. How much would it cost to rent 32 bikes?

1. \*Look in the rule box and match one to each question.

*A* = *l* x *w,*  *V* = *l* x *w* x *h,*

, 

1. A rectangle has a length of 6cm and a width of 5 cm.

a. Rule: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b.Calculate:

1. A circle has a radius of 4cm. What is its circumference?

a. Rule: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. Calculate:

1. A bike rider travels at 20 km per hour for 6 hours, what distance is traveled.

a. Rule: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. Calculate:

1. A cuboid has a length of 8 mm, a width of 4mm and a height of 5mm. What is the total volume?

a. Formula: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. Calculate: